

UNCOVERING THE FACTS ON TOXIC CARPET

Carpets, both new and old, are a hazard to health because they offgas volatile chemical compounds, can contain heavy metal residues and harbour dust mites and harmful allergens.

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Editor's Note: Several mentions of animal experiments are made in this article. NEXUS does not agree with the practices of animal experimentation and vivisection, but we also don't want to censor the articles we publish.

Carpet is a big part of people's lives in many countries. It keeps us warm, absorbs noise and can feel soft and look attractive. Over 90% of homes are carpeted in the UK, 65% in Germany and 60% in the USA.¹ However, there are concerns related to carpeted dwellings and workspaces. Carpet emits toxins which are harmful to health, and old carpet traps pesticide residues in addition to dust containing lead and other heavy metal residues. Carpet also has consequences for the environment.

CHEMICALS IN NEW CARPET

New carpets release chemicals that are detrimental to health, particularly in the first few days after installation. The United States Environmental Protection Agency (US EPA) recommends purchasers request low-toxin-emitting carpet, cushioning and adhesives as well as ask that the new carpet be well ventilated before being laid. The US EPA further advises buyers to "consider leaving the premises during and immediately after installation, or schedule the installation when the space is unoccupied".²

New synthetic carpets offgas volatile organic compounds (VOCs) such as formaldehyde, ethylbenzene, toluene, xylene, acetonitrile, styrene, trichloroethylene, azulene, benzene, diphenyl ether and dodecane.³ Some of these substances are on the US EPA's List of Extremely Hazardous Substances:⁴

- Formaldehyde is included on the list and "can cause watery eyes, burning sensations in the eyes and throat, nausea and difficulty in breathing in some humans exposed at elevated levels (above 0.1 parts per million)".⁵ It is a carcinogen and can cause dermatitis, aggressive behaviour, bronchial spasm and other medical conditions.⁶

- Ethylbenzene has caused tumours in rats and mice, neurological effects in humans, throat and ear irritation and chest constriction. Other animal studies have reported foetal resorptions, skeletal deformations and an increased incidence of extra ribs.⁷

- Toluene in high levels can cause birth defects in humans,⁸ and has made it to the EPA's Community Right to Know List and Toxic Substances Control Act Inventory. Effects include "fatigue, weakness, confusion, euphoria, headache, dilated pupils, dermatitis, central nervous system recording changes, psychophysiological test changes and bone marrow changes".⁹

- Xylene is on the EPA lists and causes some similar effects including vomiting, abdominal pain, coordination problems, weight loss, excitement, drowsiness and staggering gait.¹⁰

- Acetone makes it onto the EPA's lists and can react vigorously with oxidising chemicals. It is considered "a severe irritant", and "Human systemic effects by inhalation include changes in electroencephalogram, changes in carbohydrate metabolism, nasal effects, respiratory system effects, nausea, vomiting and muscle weakness".¹¹

- Styrene, used in carpet backing, is a suspected carcinogen and irritant,¹² has caused adverse reproductive effects in animals and can cause "eye and nose irritation, drowsiness, olfactory (smell) changes, and defatting dermatitis".¹³

- Benzene, a known carcinogen,¹⁴ can produce myeloid leukaemia, Hodgkin's disease and lymphomas. It is a poison by inhalation and a skin and eye irritant. Birth defects and

adverse reproductive effects were found in animals exposed to benzene, and effects were seen at less than one part per million.¹⁵

Other chemicals found in carpet include bis(2-ethylhexyl)phthalate, caprolactum, diethylene glycol, p-Dichlorobenzene, hexane and vinylcyclohexene.¹⁶ Bis(2-ethylhexyl)phthalate, diethylene glycol and vinylcyclohexene are suspected carcinogens, and p-Dichlorobenzene is a known carcinogen which can produce minor irritations as well as cirrhosis of the liver. Caprolactum and hexane have caused foetal abnormalities in animals, and hexane can induce nausea and various other mild symptoms. In humans it has brought about hallucinations, structural changes in nerves, motor neuropathy and respiratory irritation.¹⁷

In 1988, more than 500 complaints were made to the US Consumer Product Safety Commission (CPSC) regarding health problems related to carpet (see the website <http://www.cpsc.gov/cpsc/pub/pubs/454.htm>). The CPSC then commissioned a study, in which 31 chemicals were identified as being released from carpets. Even though some chemicals were found in very small amounts and not thought to be dangerous, the Commission admitted the combination could create a potent cocktail. The effects of long-term exposure to the substances were not measured.¹⁸

TOXINS IN CARPET BACKINGS AND ADHESIVES

It is important to note that carpet is not the only piece of the toxic puzzle. Some of the abovementioned chemicals are contained in backings and adhesives, thus also contributing to the noxious emissions.

One chemical, 4-PC, used in the latex backing on 95% of carpets in the US¹⁹ and also used to glue backing to carpet, is the chemical that gives off that new carpet smell. It has been associated with producing eye, nose, throat, upper respiratory and other problems when people are exposed to new carpeting.²⁰ It has also been named as a suspect in the US EPA's infamous "sick building" incident of 1988; the symptoms of ill staff resolved when the carpet was replaced.²¹ Not surprisingly, industry studies have found no toxic effects of 4-PC,²² but it "continues to be emitted at measurable levels for a longer time" than other chemicals associated with carpet,²³ so long-term effects may be of concern.

Ethylbenzene is found in carpet glue and it produces a long list of negative health effects on humans and animals.²⁴

Adhesives and sealants initially offgas more than carpet does in the first few weeks. Commercial installation of carpet is of particular concern as glue is spread across the floor, whereas residential application requires much less adhesive and often uses stapling around the perimeter of a room.²⁵

Seam sealant has also been named as toxic. The chemical 1,1,1-trichloroethane was a common ingredient used in the US until government regulations stipulated that it be phased out by 1996.²⁶ However, the hazardous toluene may still be found in some sealants.

The US EPA lists moth repellents as containing volatile organic compounds.²⁷ Used commonly on woollen carpets, mothproofing is considered a "necessary evil".²⁸ Mothproofing chemicals contain naphthalene, which is "cumulatively toxic and emits vapour that can produce toxic reaction in sensitive individuals". Naphthalene is most dangerous to newborns.²⁹

Fire-retarding measures can also prove to be toxic. In a UK study in 2000, a brominated flame-retardant chemical (BDE-209) was found in carpet in "significant levels". The Healthy Flooring Network acknowledges that safety should not be compromised, and states that other, less-toxic choices are available. These include "redesign and/or reformulation of materials to achieve lower flammability".³⁰

MULTIPLE CHEMICAL SENSITIVITY CONCERNS

Some people are more sensitive than others may be to toxins. Multiple chemical sensitivity (MCS) is a relatively new term applied to people suffering reactions similar to many listed above when exposed to small amounts of chemicals. The condition has also been named "toxicant-induced loss of tolerance" (TILT).³¹ Some doctors consider the condition psychological, noting that 65% of patients with MCS have at some stage suffered from depression. Others argue to the contrary, that MCS may *cause* depression. In any event, the US EPA advises doctors that "complaints should not be dismissed as psychogenic, and a thorough workup is essential".³²

MCS is caused by exposure to chemicals known as "initiators".

These include pesticides, solvents, carpets, glues and formaldehyde. Symptoms such as respiratory illness, central nervous system problems (memory loss, concentration problems, irritability, insomnia, depression, etc.), gut, muscle and joint pain and headaches can be triggered by low-level exposure to chemicals such as air fresheners, newly painted rooms, cleaning substances, solvents, tobacco smoke, etc.³³ All initiators listed are related to carpet, directly or by treatment or installation. Triggers may also

be related to carpet acting as a sink.

Cindy Duehring, an American woman, suffered from MCS after being poisoned by pesticides in 1985. She consequently became an activist and set up the Environmental Access Research Network (EARN), which merged with the Chemical Injury Information Network (CIIN) in 1994. A new division, the MCS Research Fund, was set up to study multiple chemical sensitivity. The fund was renamed the Cindy Duehring MCS Research Fund after Cindy died in 1999 from complications related to her initial poisoning.³⁴

INDUSTRY AND UNIVERSITY DENIALS

In the early 1990s, Cindy undertook extensive research into carpet and its health effects. One incident she reported involved the McIver family's experience with carpet and the carpet industry. The son, Christopher, suddenly began having convulsions on their new carpet. The parents, Jocelyn and Kevin, both lawyers, requested information from the manufacturers regarding any negative reactions associated with new carpet. They were advised in a letter from Monsanto that "We have not heard of any reactions similar to what you describe".³⁵

It was later discovered that Monsanto had people on the board of the Carpet and Rug Institute (CRI), and the Institute was well aware of over 1,000 complaints reported by workers in the "sick building" incident at EPA headquarters. The Consumer Product Safety Commission had also stated in 1990, a year before the McIvers bought their carpet, that it would furnish the carpet industry with reports from 206 households regarding respiratory

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and central nervous system problems related to carpet. Eventually the McIvers had their carpet removed, and Christopher's tremors completed ceased. Unfortunately, Christopher suffered a damaged immune system, consistent with chemical exposure. He also exhibited nerve tissue damage.³⁶

Bill Hirzy, PhD, was a senior scientist at the US EPA and president of EPA Union Local 2050 at the time. He commented of the EPA that even though the sick building incident had already occurred, an information brochure still stated that "Limited research to date has found no links between adverse health effects and the levels of chemicals emitted by new carpet".³⁷

Research published in 1995 by Cornell University dismissed reactions to new carpet as "psychogenic". Dubbed by the University as the "the most comprehensive review on the health effects of any indoor product", it acknowledged only carpet adhesives as affecting indoor air quality (IAQ) or causing sick building syndrome (SBS). Cornell pointed out that "new, low-emission adhesives...are now available, though they may be more expensive". However, the University's objectivity may be questioned due to the fact that the Carpet and Rug Institute funded this research.³⁸ A presentation is available for viewing at the CRI website (<http://www.carpet-rug.com/studies.cfm>), where this fact is not made obvious. Some slides could be mistaken for a CRI promotional presentation.

TEST RESULTS SWEEPED UNDER THE RUG

In the early 1990s, Anderson Laboratories undertook carpet testing for people with health complaints by employing the American Society for Testing and Materials (ASTM) E981 procedure, widely used since the 1960s.³⁹

This involved blowing air from the carpet over mice and monitoring their reactions. Symptoms were typical of human reactions to chemicals, such as burning eyes and nose, difficulty breathing and even tremors.⁴⁰

The Anderson Laboratories tests were dismissed by many as invalid. Hal Levin, an air quality expert, stated that the methodology was not scientifically valid.⁴¹

The US EPA replicated the results in Anderson Laboratories, using its own new carpet sample and its own equipment. However, when the EPA attempted to replicate the test in its own laboratories, the results were not as conclusive.⁴²

Bill Hirzy stated that the EPA created its own protocol, changing the humidity so toxins were absorbed by moisture in the air, making the air clean.

The Carpet and Rug Institute also asked Dr Yves Alarie (who developed the ASTM E981 test in the 1960s) from the University of Pittsburgh to replicate Anderson's tests. Dr Alarie testified before the Committee on Government Operations, Subcommittee on Environment, Energy and Natural Resources, US House of Representatives, on June 11, 1993 that "Her [Rosalind Anderson's] results are perfectly reproducible in my laboratory". He also stated that "This method, ASTM-E981, has been used all over the world and I have never received a complaint from a user of it that the method itself produces neurotoxic nervous system effects".⁴³

The Anderson results on carpet emissions were published in the *Journal of Nutritional and Environmental Medicine* in 1995.⁴⁴

IMPACT ON CARPET INSTALLERS' HEALTH

Anecdotal evidence also points to medical problems related to carpet installation. A high incidence of lung cancer has been reported within the industry, in addition to typical reactions to chemicals. These reactions include neurological and respiratory symptoms such as dizziness, forgetfulness, tremors, memory loss, pins and needles and recurring nosebleeds. One worker noted that the process of seaming creates potent fumes. Warnings are given not to inhale these chemicals or burn them, but a hot seaming iron is required to melt materials together.⁴⁵

Carpet installers who have been tested have shown high levels of chemicals in their blood, resulting in nerve damage and cognitive impairment. Studies have found that there is a higher instance of leukaemia and testicular cancer in carpet workers than in control groups. Other studies have found that carpet-layers are at risk of oral and pharyngeal cancer. Those exposed to solvents have been found to be at an increased risk of neuropsychiatric disorders. A Russian study found that during "animal experiments simulating working conditions, the central nervous system is the most sensitive".⁴⁶

HAZARDS OF OLDER CARPET

Unfortunately, just because a carpet is no longer new, this does not mean it is healthy! Older carpets can be worse than new ones, because they act as a sink for dirt and chemicals.

Dust, Dust Mites and Damp

Older carpets and worn carpets are a great repository for deep dust.⁴⁷ Environmental engineer John Roberts commented that "If truckloads of dust with the same concentration of toxic chemicals as is found in most carpets

were deposited outside, these locations would be considered hazardous waste dumps".⁴⁸

Dust mites thrive in carpet; they survive on flakes of dead skin and leave excrement that is extremely allergenic.⁴⁹ A study commissioned by the Healthy Flooring Network and undertaken by Dr Jill Warner, Senior Lecturer in Allergy and Immunology at the University of Southampton, England, found that carpets contained more dust mites than did bedding. It was also noted that carpets "are actually the biggest reservoir for allergy-causing dust mite and pet allergens in the home".⁵⁰

Another UK study in 2000 revealed that three out of eight carpet samples were shown to contain notable levels of permethrin, used to control dust mites. Earlier German research discovered that "elevated levels of permethrin found in domestic homes were largely due to the presence of treated carpets". Permethrin has been shown to have neurotoxic effects on laboratory animals—but if it permeates carpet fibres, dust mites continue to survive regardless of the chemical.⁵¹

Mould and mildew cannot be removed if a carpet has been wet for more than a day or two. In this instance, the carpet and padding or underlay is rendered useless and must be replaced, as cleaning will not dislodge the fungal growth.⁵² The US EPA's advice is to replace carpet if it has been damp for more than 48 hours.⁵³

Asthma and Allergens

Asthma attacks can be triggered by dust mite allergens.⁵⁴ The Healthy Flooring Network reported that Dr Jill Warner's study

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"highlights fitted carpets as playing a major role in the alarming rise of asthma and allergies". British households have the most carpeting at over 90%, and also the highest rate of asthma and allergies in the world.⁵⁵ Another UK study, conducted in 2001, revealed that, along with undertaking appropriate cleaning measures, removing carpet from infants' bedrooms reduced asthma and allergies in children at risk.⁵⁶

The Healthy Flooring Network also reported that the Carpet Foundation in the UK was taken to the Advertising Standards Authority after making false claims in an advertisement. The Carpet Foundation was prevented from making further claims "implying that it was an undisputed scientific fact that there was no link between carpet and asthma".⁵⁷

Pesticides and Volatile Organic Compounds

Any chemical walked in on shoes or brought inside on wheels of prams or bicycles and in the paws of animals can become trapped in carpet. Tests on dogs' paws have detected very high levels of pesticide residues.⁵⁸ An alarming statistic from the US EPA states that "80% of most people's exposure to pesticides occurs indoors". Chemicals may also drift in through open windows or come in on clothes and be absorbed by carpet.⁵⁹ Pesticides tracked inside will not be broken down, due to lack of sunlight. Vacuum cleaning can "reduce the accumulation of such contaminants, but not even hot-water extraction can eliminate them all".⁶⁰ In the United States, pesticides and VOCs are estimated to cause up to 3,000 cases of cancer per year.⁶¹

Robert Lewis undertook research for the US EPA and discovered that plush carpet samples aged between 10 and 33 years contained very high levels of chemicals. Numerous carpets had accumulated pesticides used in insect sprays. Pesticide levels showed up many times higher than any amount of insect spray that would be applied in a single use.⁶²

It is also important to note that when a chemical is outlawed, this doesn't mean it will not be found in home and outdoor environments any longer. Banned in the US in 1972, DDT was found in 1992 and 1993 in carpets of 90 of 362 homes studied by Jonathan D. Buckley of the University of Southern California and David E. Camann of the Southwest Research Institute.⁶³

Scotchgard™ is a product used on carpets as a stain inhibitor. Until 2000, the formula contained the chemical perfluoro-octanyl sulphate (PFOS). Manufacturer 3M removed PFOS from the formula in 2000, as the toxin had been found in high levels in wildlife tissue samples, particularly in urban areas. The chemical's full effects are unknown but, under testing, high levels caused reproductive problems in rats.⁶⁴

VOC adsorption (gathering of a substance on a surface in a condensed layer) can occur on carpet fibres, and the chemicals released at a much later date. For example, curing paint can off-gas VOCs which settle in carpet.⁶⁵ This can also be true of household pesticides such as those used in impregnated strips, bombs and foggers, and also substances such as the extremely hazardous formaldehyde offgassed from resins and subflooring materials⁶⁶ as well as pressed wood products and glues.⁶⁷ Toxic deposits can also remain after cleaning with certain products.⁶⁸

According to the US EPA, VOCs occur at levels two to five times higher indoors than outdoors and 1,000 times higher when occurrences like renovations are taking place.⁶⁹ Last year, *New Scientist* reported that studies undertaken on adults in the late 1980s found exposure to toxic pollutants 10 to 50 times higher indoors than outdoors.⁷⁰ Strong associations have been made between gardening pesticides and "hyperactivity, leukaemia and damage to the blood/brain barrier in children, and with birth defects in newborns due to maternal exposure".⁷¹ Dwellings with many soft or textured surfaces were named in a European study as collecting more airborne benzene than homes without these types of surfaces. Airborne benzene is implicated as a cause of leukaemia.⁷² Even small amounts of VOCs can have effects such as headaches, nausea and respiratory problems on allergy sufferers, people with lung conditions and the elderly.⁷³

Carpet shampoos, containing ammonia and perfumes, can be toxic. The known carcinogen perchloroethylene may be found in carpet cleaner.⁷⁴ Some cleaners contain solvents, often petroleum-based, which emit VOCs.⁷⁵ Other hazardous chemicals such as toluene and benzene have been found in fibre cleaners.⁷⁶ Carpet deodorisers are also cause for concern, as they degrade very slowly. Some contain musk-xylene, which has caused tumours in mice, or musk-ambrette, a neurotoxin to animals.⁷⁷

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Lead and Other Heavy Metals

Lead is a very major concern with carpet acting as a sink. John Roberts (also known as Dr Dust) tested the lead level when his daughter moved house. It was 7,800 micrograms per square metre, while the US EPA's safety threshold is a maximum of 434 micrograms per square metre.⁷⁸ Roberts says that any typical household dust sample would cause concern if tested, as it would contain high concentrations of heavy metals, including lead.⁷⁹ Plush and shag carpets are more problematic than flat carpets, as they are prone to collecting more toxic dust.⁸⁰

The US EPA advises that lead poisoning symptoms in adults include gastrointestinal discomfort, constipation, anorexia, nausea, fatigue, weakness, personality changes, headache, hearing loss, tremor and lack of coordination. In infants and small children, symptoms include irritability, abdominal pain, ataxia (loss of muscle coordination, especially at the extremities), seizures, loss of consciousness, chronic learning deficits, hyperactivity and reduced attention span.⁸¹ The Environmental News Network also reported that lead causes "kidney damage, high blood pressure, disrupted blood cell production and reproductive problems".⁸²

Petrol/gasoline has been regulated in many countries since the 1980s but lead is still in the soil, especially near roads, and may either come inside onto the carpet via shoes or drift in through windows and doors. The American Academy of Pediatrics estimates that "three to four million children in the US under age six have blood lead levels that could cause impaired development, and an additional 400,000 fetuses are at similar risk".⁸³

Infants are particularly vulnerable to ingesting contaminated dust in carpet because they spend so much time on the floor.⁸⁴ One explanation as to why children and babies are at such a high risk is that they have a higher rate of metabolism than adults and their organs are still developing. Relative to adults, they inhale 23 times as much air.⁸⁵ Breastfed babies are at an even higher risk, as the toxins come through their mothers' milk, but Roberts emphasises that "the advantages of breastfeeding outweigh the risks from these pollutants".⁸⁶ However, carpet dust from areas where toddlers play has been named as the best indicator of their likely blood lead level.⁸⁷

Research into Carpet's Negative Health Effects

A controlled study of 30 female subjects indicated that the negative effects of carpet are very real. The women undertook various tasks including logical reasoning, typing and addition tests. During one round of testing, a 20-year-old carpet was concealed on racks behind a screen near the subjects. Data revealed that when the carpet was present, test scores were lower. Without the carpet, 6.5% more words were typed with 5% fewer errors. Furthermore, the subjects scored 3–4% higher on the addition and logical reasoning tests. When the carpet was present, headaches were also reported.⁸⁸

A Stanford University study of children at play has implications for carpet, as it brought to light that in a 10-hour period the children spent six hours in contact with some surface.⁸⁹

Dr Dust believes that phasing out emissions is necessary because infants are not as well equipped as adults to deal with toxins, as their immune systems are not fully developed. He cites the long-term benefit of health cost savings as another incentive for this action.⁹⁰

ENVIRONMENTAL PROBLEMS

Environmental concerns related to carpets are plentiful.

In the UK, environmental quality standards were exceeded many times in 1997. Water in the North East and Midlands regions was found to have high levels of chemicals used in moth-proofing.⁹¹

Carpet dyes pollute waterways, and showroom carpet samples and scraps create unwanted waste. Carpet is energy intensive to produce, and old carpets being replaced are generally put into landfills. However, some companies are looking at ways to recycle, and trials have been undertaken by Shaw Industries, Inc. on using carpet as a reinforcement in concrete.⁹²

The average carpet's life span, whether in commercial or residential use, is eight years. Consequently, in a Canadian study in the early 1990s, carpet was named as the flooring creating the most environmental impact. A Dutch study had the same findings but specified nylon carpet in its results.⁹³

The US EPA acknowledges that there are obstacles in carpet recycling, as there is no infrastructure set up to cope with it.⁹⁴

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ALTERNATIVES AND SOLUTIONS

As far as dust is concerned, *no* carpet is the only real solution. Dwellings with bare floors and a few rugs contain around a tenth of the dust found in a house with wall-to-wall carpet.⁹⁵ The best option for MCS sufferers would seem to be plain ceramic tiles.⁹⁶

However, there are ways to reduce carpet-related chemical exposure. The use of carpet glues and adhesives can be avoided or reduced in some situations. Woven carpets necessitate much less adhesive backing because they are more stable than tufted carpets. Another way of avoiding adhesives is to use mechanical fastening. A patented hook and loop system utilises fabric and hooks taped to the floor and can be used on seams and room perimeters.⁹⁷

Woollen carpet is often cited as a suitable floor covering, as it is naturally flame resistant and very durable. According to wool industry-funded research, VOCs such as formaldehyde and nitrogen oxide that become trapped in fibres will not be released in woollen carpets, as they chemically bond to the fibres. However, this claim has not been verified.⁹⁸

CARPET MAINTENANCE

New Scientist reported that according to Dr Dust (John Roberts), excessive vacuum cleaning is necessary to remove the build-up of toxic dust in carpet. He suggests vacuuming carpet near the house entrance 25 times per week, high traffic areas 16 times and the remaining carpet eight times. Apparently this will remove a good deal of the deep dust, after which time half of the initial vacuuming will be necessary each week to keep the amount of dust to a minimum.⁹⁹

Vacuuming can cause trapped dust to become airborne, so it is essential to use a good-quality vacuum cleaner to remove it effectively. Vacuum cleaners with high efficiency particulate air

(HEPA) filters are the most efficient.¹⁰⁰ These can trap particles of 0.3 microns in size.¹⁰¹ A power head can collect three to six times more dust than a regular vacuum cleaner head can. Some vacuum cleaners also have a red light that changes to green when it is no longer picking up dust.¹⁰² This cleaning process can take as long as 45 minutes per square metre of old carpet, but the time is reduced substantially once this major task has been undertaken for the first time.¹⁰³

Steam cleaning can also be effective, and if done professionally it can kill fleas, dust mites and some bacteria¹⁰⁴ with minimal environmental impact.

Dr Dust has also found that high-quality doormats can "reduce the amount of lead in a typical carpet by a factor of six"¹⁰⁵ if feet are wiped twice before entering a dwelling. Taking shoes off is also very effective in keeping pesticides and lead out of carpet.

CONCLUSION: TREADING CAREFULLY FOR OUR HEALTH

Chemicals contained in new carpet, particularly if it is synthetic, are toxic and can be of concern to many people, particularly those with multiple chemical sensitivity. The carpet industry insists this type of floor covering is a clean option, but studies have shown otherwise. VOCs are emitted from both new and old carpet, with old carpet acting as a sink for dust containing contaminants such as lead.

Carpet is not a good option for asthma and allergy sufferers, and installers have reported ill health related to their trade. Studies have shown old carpet can also have immediate negative effects on health and productivity. Keeping carpet clean to acceptable levels for good health creates a substantial workload, and carpet is not very environmentally friendly.

The long-term health effects of carpet are not clear, but what *is* clear is that there are major concerns related to having a carpeted home, school or place of business.

Dwellings with bare floors and a few rugs contain around a tenth of the dust found in a house with wall-to-wall carpet.

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